

REMARKS

Reconsideration and allowance in view of the preceding amendments and following remarks are requested. Claims 1 and 7 have been amended and claim 6 has been cancelled. Thus, claims 1, 3-5, 7, and 9-31 are pending in the application. Applicants respectfully request reconsideration of the claims.

What a prior art reference teaches one of ordinary skill in the art is a question of fact. *In Re John R. Beatie*, 974 F.2d 1309, 1313 (Fed. Cir. 1992). Applicants resubmit herewith the Declaration of Joachim Heitbaum (the "Heitbaum Decl."), which was submitted in response to the final Office Action but not entered or considered, providing evidence how one skilled in the art would view the cited prior art and the claimed invention. Applicants also submit herewith the Declaration of Christiane Ripp (the "Ripp Decl.") providing evidence of the examples cited in the specification and information about the claimed invention.

Claims 1, 3-7, 9, 10, 13, and 15-31 were rejected under 35 U.S.C. § 103(a) as obvious over WO 00/44061. The Examiner asserts that U.S. Patent 6,709,789 to Hambitzer et al. ("the '789 patent") is an English equivalent of WO 00/44061. The subject matter of claim 6 has been incorporated into claim 1 and claim 6 has been cancelled. Applicants respectfully traverse each of the rejections and submit that the '789 patent, taken alone or in combination with other art or the knowledge of one having ordinary skill in art, does not disclose or suggest each and every feature of any of claims 1, 3-5, 7, 9, 10, 13, and 15-31.

The '789 patent teaches an electrochemical cell in which safety is increased by providing a salt in solid state in a porous structure in the range of at least one of the electrodes. As has been explained in prior responses, the safety features which result from the invention embodied by the '789 patent result from the chemical properties of the

salt, and not the physical nature of the microporous structure as in the present claims.

The '789 patent teaches two ways of incorporating salt into the cell:

- 1) A particulate structure consisting of salt particles which may be a loose filling of salt grains or may be a solid body formed by binding of salt particles or by sintering of salt grains (as shown in Fig. 2 and col. 4, lines 13-32 of the '789 patent);
- 2) Coating of the salt onto a porous carrier material, which can either be rigid (e.g., made from glass or oxide ceramics) or a flexible fiber compound structure (e.g., in the form of felt fleece or fabric)(as shown in Fig. 3 and col. 4, lines 33 to 60 of the '789 patent).

In either embodiment, in order to achieve the safety benefits of the '789 patent, the pores have to be of sufficient size so that a discharge of active mass, which grows at the electrode during charge or discharge of the cell, comes into contact with a sufficient surface area of salt particles when penetrating into the porous structure. (Col. 3, lines 15-30 of the '789 patent).

The first embodiment disclosed in the '789 patent requires that the material of the particles is a salt, whereas the present claims require that the particles not be an ionically dissociating material. This embodiment clearly teaches away from the present invention. The second embodiment, upon which the Examiner bases the obviousness rejection, fails to disclose structure forming, non-ionically dissociating solid particles or a volume proportion of at least 40%. In order to arrive at the invention of the present claims, the Examiner alleges these two important features would have been obvious to one of ordinary skill in the art.

With respect to the lack of the non-ionically dissociating material in particulate form, the Examiner simply states "the artisan would have been motivated to use the

ceramic of Hambitzer et al. in a particulate form as the carrier for the salt particles” and that “[i]t would have been obvious to use spherical ‘particles,’ as the carrier material.” (November 13, 2008 Office Action at p. 6). First, the Examiner provides no explanation as to why one of skill in the art would be motivated to try this configuration. In fact, prior to the invention embodied by the present claims, one of the ordinary skill would have had no reason to try this configuration and in fact would have believed this configuration would degrade the safety features of the ’789 patent because it would have resulted in a decreased area for the reaction to occur. The aim of the ’789 patent is to provide salt as a reactive component. In order to provide an optimum reaction, a large surface contact with the salt is required. (Col. 3, lines 24-25 of the ’789 patent). Using salt particles as described by the first embodiment is ideal for this purpose. There would simply be no reason to use non-salt particles as one of ordinary skill in the art would have expected this configuration to result in less surface contact with the salt which would not enhance the safety features of the ’789 patent.

The use of the fibrous carrier is disclosed as an alternative which provides increased mechanical stability (Col. 4, lines 45-47 of the ’789 patent) and to ensure, “by appropriate constructive measures that the porous structure is fixed to the surface of the electrode... In this context, a porous structure in the form of a compound of salt particles or a porous structure formed by means of a porous solid matter layer is more advantageous than a loose filling.” (Col. 5, lines 7-14 of the ’789 patent). In other words, the compound structure is to address issues with the porous particle structure displacing the salt from the electrodes. Utilizing ceramic particles as a carrier for the salt particles would have resulted in the same problems with dislodging the salt from the electrode surface and therefore would not have been a viable alternative to what is taught in the ’789 patent. In fact, one of ordinary skill in the art would have expected such a

configuration to cause deleterious results. Therefore, it clearly would have been against the rationale of the '789 patent and not obvious to one having skill in the art to use ceramic in a particulate form as the carrier of the salt particles.

With respect to the particulate porous structure being provided with a volume proportion of solid particles of at least 40%, the '789 patent clearly teaches away from such a high solid volume proportion. Specifically, the '789 patent states that the salt as a reactive component must be contained in a sufficient amount per unit volume to be effective. (Col. 5, lines 49-50 of the '789 patent). In other words, the '789 patent teaches that a large surface contact should be provided between the salt and the substances which are formed at the electrode. (Col. 3, lines 24-26 of the '789 patent). In the case of the salt being contained in a porous solid matter layer, the '789 patent teaches away from a highly compacted structure noting that "the structure in which the salt is contained should not have too small pores." (Col. 5, lines 5-6 of the '789 patent). Given that one of ordinary skill in the art would have understood that the increased safety resulting from the features of the '789 patent is better accomplished with larger pores, there clearly would have been no reason to adjust the volume proportion of solid particles to levels as high as those required by the current claims. Furthermore, as has been discussed previously, achieving a solid volume proportion as high as 40% requires taking special and difficult measures. While one of ordinary skill might have been capable of producing compressed particles with such a high solid volume proportion, they would not have done so because it would have decreased the effectiveness of the salt as a safety feature. Any suggestion that these steps would have been obvious to try, particularly in light of the fact that the '789 patent teaches away from these missing elements, is clearly based on hindsight and knowledge of the present invention.

In the Advisory Action mailed February 27, 2009, the Examiner made several

statements regarding the examples given in the '789 patent and the specification of the present application. In particular, the Examiner asserts that "there appear to be several differences in the compared battery, and as such, it the source of the alleged improvement cannot be ascertained." (February 27, 2009 Advisory Action at p. 2). The Examiner goes on to note that the '789 patent recites LiAlCl_4 but notes that compound is not explicitly described in the Examples of the present application. (February 27, 2009 Advisory Action at p. 2). A declaration from Dr. Christiane Ripp, who is an inventor of the present application and a consultant working for the assignee of the '789 patent and who has access and personal knowledge of both the experiments described in the Examples of the present application and the '789 patent, is submitted with this response. (See Ripp Decl. ¶¶ 1-2). Dr. Ripp confirms that the same electrolyte was used in the experiments compared, including not only the same conducting salt, LiAlCl_4 , but also in the same concentration ($\text{LiAlCl}_4 \times 1.5 \text{ SO}_2$). (See Ripp Decl. ¶ 5). Further, Dr. Ripp confirms the same type of experimental cell was used for both the experiments cited in the present application and those of the '789 patent. (See Ripp Decl. ¶ 5). Therefore, the improved safety features of the present claims can properly be attributed to the porous structure consisting of structure forming particles which are not a salt as embodied by the present claims. (See Ripp Decl. ¶ 5).

The Advisory Action also alleges that several features describes in the examples are not recited in the claims. (February 27, 2009 Advisory Action at p. 2). Applicants have disclosed the best mode of carrying out their invention as required by § 2165 of the MPEP, but are unaware of any requirement that requires the claims to be limited to the preferred embodiment. To the extent the present claims embody the preferred embodiment while still applying to other potential embodiments of the same invention, Applicants believe the claims are appropriate in scope.

CONCLUSION

In view of the foregoing claim amendments, remarks and the declaratory evidence submitted herewith, which should be given substantial weight, Applicants submit that the rejection of each of claims 1, 3-5, 7, and 9-31 is improper because the cited prior art fails to disclose or suggest each and every element of the claims. Reconsideration and allowance are requested. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

In the event that this paper is not timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02-2135.

Respectfully submitted,

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